WE CLAIM:

1. A device for determining frequency of a laser producing an output light beam having a laser frequency, comprising:

a fringe-producing optical element to generate an interference pattern from light derived from the output light beam, the interference pattern defining a pattern period;

a detector unit disposed to detect the interference pattern, the detector unit including at least three detector elements disposed to detect respective portions of the pattern period; and

a control unit coupled to receive detection signals from the detector unit and adapted to generate a laser frequency control signal for controlling the laser frequency.

2. A device as recited in claim 1, wherein the at least three detector elements are positioned to detect different portions of the interference pattern.

3. A device as recited in claim 2, wherein the different detected portions of the interference pattern are separated in phase by approximately $2k\pi/n + m\pi$, where n is the number of detector elements, and k and m are integers.

4. A device as recited in claim 3, wherein the different detected portions of the interference pattern are separated in phase by approximately $2\pi/n$.

5. A device as recited in claim 2, further comprising additional detector elements disposed to detect similarly phased portions of the interference pattern as associated detector elements of he at least three detector elements.

6. A device as recited in claim 1, further comprising a beamsplitter disposed to direct light to the fringe-producing optical element from the output light beam.

7. A device as recited in claim 1, wherein a position of a bright fringe of the interference pattern relative to the detector unit depends on frequency of the output light beam.

8. A device as recited in claim 1, further comprising a reflector disposed between the fringe-producing optical element to direct light from the fringe-producing optical element to the detector unit.

9. A device as recited in claim 8, further comprising the laser and wherein the output light beam is incident on the fringe-producing optical element.

10. A device as recited in claim 1, wherein the fringe-producing optical element is a non-parallel etalon.

11. A device as recited in claim 10, wherein the non-parallel etalon has substantially flat, non-parallel surfaces.

12. A device as recited in claim 10, wherein the non-planar etalon has at least one curved surface.

13. A device as recited in claim 10, wherein the non-planar etalon is a diffractive etalon.

14. A device as recited in claim 10, wherein the non-planar etalon is a binary etalon.

15. A device as recited in claim 10, wherein the non-planar etalon is a Fresnel etalon.

16. A device as recited in claim 1, wherein the detector unit is disposed to detect the periodic interference pattern reflected from the fringe-producing optical element.

17. A device as recited in claim 1, wherein the detector elements are illuminated by a single period of the interference pattern.

18. A device as recited in claim 1, wherein the detector elements are illuminated by more than one period of the interference pattern.

19. A device as recited in claim 1, further comprising the laser and wherein the control unit is coupled to the laser to control the laser frequency.

20. A device as recited in claim 1, wherein the control unit generates a signal indicative of laser power from the detection signals.

21. A device as recited in claim 20, further comprising the laser, the control unit being coupled to the laser, the control unit controlling laser power based on the signal indicative of laser power.

22. A device as recited in claim 1, further comprising a carrier plate, the fringe-producing element and detector unit being mounted on the carrier plate.

23. A device as recited in claim 1, further comprising the laser and a collimating element to substantially collimate the output light beam.

24. A device as recited in claim 23, further comprising a focusing element and an output optical fiber, the focusing element disposed in the collimated output light beam to focus the output light beam into the output fiber.

25. A device as recited in claim 1, wherein the control unit includes a power supply and is coupled to provide electrical power to the laser.

26. An optical communications system, comprising:

an optical communications transmitter unit having one or more lasers, at least one of the one or more lasers producing a laser output beam and having a wavelength stabilizing unit, the wavelength stabilizing unit including

a fringe-producing element to generate an interference pattern from light derived from the output beam, the interference pattern defining a pattern period,

a detector unit disposed to detect the interference pattern, the detector unit including at least three detector elements disposed to detect respective portions of the interference pattern, and

a control unit coupled to receive detection signals from the detector unit and adapted to generate a laser frequency control signal for controlling wavelength of the at least one of the one or more lasers,

an optical communications receiver unit; and

an optical fiber communications link coupled to transfer optical communications signals from the optical communications transmitter unit to the optical communications receiver unit.

27. A device as recited in claim 26, wherein the at least three detector elements are positioned to detect different portions of the interference pattern.

28. A device as recited in claim 27, wherein the different detected portions of the interference pattern are separated in phase by approximately $2k\pi/n + m\pi$, where n is the number of detector elements, and k and m are integers.

29. A device as recited in claim 28, wherein the different detected portions of the interference pattern are separated in phase by approximately $2\pi/n$.

30. A device as recited in claim 27, further comprising additional detector elements disposed to detect similarly phased portions of the interference pattern as associated detector elements of he at least three detector elements.

31. A system as recited in claim 26, further comprising a series of fiber amplifiers disposed on the optical fiber communications link, the series of fiber amplifier including at least one fiber amplifier unit.

32. A system as recited in claim 26, wherein the optical communications transmission unit includes at least two lasers operating at different wavelengths and further comprising wavelength division multiplexing elements to combine light output from the at least two lasers to produce a multiple channel optical communications signal coupled to the optical fiber communications link.

33. A system as recited in claim 32, wherein the optical communications receiver unit includes wavelength division demultiplexing elements to separate the multiple channel optical communications signal into signal components of different wavelengths and further includes channel detectors to detect respective signal components.

34. A stabilized frequency laser device, comprising:

a laser generating an output light beam;

an optical element that generates an interference pattern from light derived from the output light beam, the interference pattern defining a pattern period;

a detector unit disposed to detect the interference pattern, the detector unit including at least three detector elements disposed to detect respective portions of the interference pattern; and

a control unit coupled to receive detection signals from the detector unit and coupled to the laser to direct a laser frequency control signal to the laser for controlling the operating frequency of the laser.

35. A device as recited in claim 34, further comprising a housing, the laser, optical element and detector unit being disposed within the housing.

36. A device as recited in claim 35, further comprising a temperature control unit disposed within the housing to control temperature of the laser, the control unit being coupled to the temperature control device to control operation of the temperature control unit.

37. A device as recited in claim 34, wherein a position of bright fringe of the interference pattern relative to the detector unit is dependent on frequency of the output light beam.

38. A device as recited in claim 34, wherein the detector elements are separated by approximately P/n, where n is the number of detector elements and P is the pattern period.

39. A device as recited in claim 34, wherein the optical element is an etalon having non-parallel surfaces.

40. A device as recited in claim 34, wherein the detector unit is disposed to detect the periodic interference pattern reflected from the optical element.

41. A device as recited in claim 34, wherein the detector elements are illuminated by a single period of the interference pattern.

42. A device as recited in claim 34, wherein the detector elements are illuminated by more than one period of the interference pattern.

43. A device as recited in claim 34, further comprising a collimating element to substantially collimate the output light beam from the laser.

44. A device as recited in claim 34, further comprising a focusing element and an output optical fiber, the focusing element disposed in the output light beam to focus the output light beam into the output fiber.

45. A device as recited in claim 34, wherein the control unit includes a power supply and is coupled to provide electrical power to the laser.